REMARKS

Claims 1-27 are pending in the application with all claims rejected in view of the prior art.

Claims 1, 2, 5-10, 13-21 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara (U.S. Patent No. 6,980,686 B2) in view of newly uncovered prior art Tanaka et al. (U.S. Patent No. 7,116,816 B2).

Claims 3, 4, 11, 12, 22 and 23 are rejected under 35 U.S.C. 103(a) on two grounds: under a combination of Kuwabara in view of Spaeth (U.S. Patent No. 2,349,012), and under a combination of Kuwabara, Tanaka and Spaeth. The first rejection is in error because Kuwabara does not teach the use of a threshold region, and Spaeth does not make up for this deficiency.

The Examiner is respectfully requested to reconsider the rejections and pass the claims on to allowance in view of the remarks below.

Comment to Examiner's "Response to Arguments"

Applicants agree with the Examiner that there is a distinction between the terms "threshold" and "threshold region." Threshold denotes a particular value – e.g., a gray level difference of 37% – while threshold *region* denotes a collection of values between an upper and a lower limit – e.g., between approximately 29.0 (lower limit) and 37.0 (upper limit). Region implicitly suggests the inclusion of boundaries. When speaking of geographic regions, geographers often use physical features (e.g., rivers) or spatial features (e.g., latitude/longitude) to define certain regions. But the common theme of regions is that items *of* the region are *within* the region.

The Examiner reads the Tanaka patent, and particularly FIG. 20, as showing a threshold region as the threshold value curve 49 and everything outside of that curve. Applicant traverses on the grounds that (a) the claims define a threshold region as "including at least one pair of upper and lower limits," and (b) Tanaka does not include an upper limit for positive values, and does not include a lower limit for negative values as shown in the "Brightness of Difference Image" plot in Tanaka FIG. 20.

The Examiner further acknowledges that, "Tanaka does <u>not</u> mark a pixel as defective if the raw datum (or difference value) is within the upper and lower limits or inside said 49." This

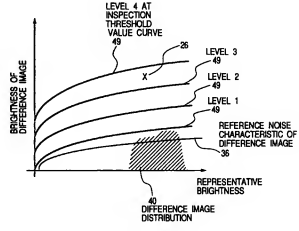
acknowledgement by itself should result in allowance of the claims over the prior art as this limitation is essentially in each of the claims:

- CLAIM 1 – "marking the target pixel as defective if the raw datum is within the threshold region."
- CLAIM 9 – "judging unit for . . . marking the pixel as defective if within the threshold range."
- CLAIM 19 – "marking the target pixel as defective if the raw datum is within the threshold region."

The Examiner continues by stating that Tanaka DOES mark a pixel as defective if the pixel is *above* the upper limit or *under* the lower limit. While this may be true – e.g., see all dots in FIG. 20 – such a teaching does not read on the claim limitations noted above. That is, a measurement occurring *outside* of the 49 curves is not the same as a measurement occurring *within* the threshold region.

The Examiner further makes a statement that the "noise [40] is interpreted the same as the claimed defect." This statement has no support whatsoever in Tanaka. The noise is not the same as a defect. Tanaka FIG. 20 identifies the noise 40 as the "NORMAL PART" to distinguish it against the various defects 26 scattered *outside* of the inspection threshold value curve. In referring to difference image distribution area 40, Tanaka makes clear that the "defect is not included in the image to be evaluated." [Tanaka, col. 11, lines 47-49] The reference noise characteristic curve in FIG. 17(a) simply refers to areas where problems with quantization noise occurs for specimen A and specimen B. While true that some of the noise plots are wholly within the threshold range—see, e.g., FIG. 20 but NOT FIG. 17(a) where part of the noise plot for specimen A is outside/above the threshold curve—the Tanaka system does not label this noise as "defects" as required under the claims.

Finally, the Examiner makes reference to FIG. 25 as illustrating multiple threshold regions where, for instance, defect 26 is located between threshold region LEVEL 2 and threshold region LEVEL 3. FIG. 25 is shown to the right. The problem with the figure to the right is that defects are detected in an open-ended fashion – the label (e.g., DEFECT LEVEL 1, 2, 3, etc.) is applied



to the measured area according to "the maximum threshold from which each of the defects can be detected." [Tanaka, col. 21, lines 28-31] Thus, a defect will be detected so long as the defect exceeds threshold curve 49 for LEVEL 1. The threshold region is not compared to the raw datum as required under the claims. Instead, the brightness difference detected is compared to each of the LEVELS singly.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 2, 5-10, 13-21 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara (U.S. Patent No. 6,980,686 B2) in view of Tanaka et al. (U.S. Patent No. 7,116,816 B2).

Claim 1 includes the following limitations:

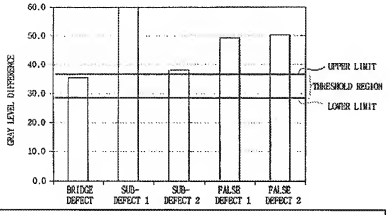
- A threshold region including at least one pair of upper and lower limits;
- Comparing the threshold region with the raw datum; and
- Marking the target pixel as defective if the raw datum is within the threshold region.

The Examiner found a new reference in an earlier action, U.S. Patent No. 7,116,816 (Tanaka), that purports to teach these limitations. The Examiner thus finds that a combination of Kuwabara with Tanaka teaches all elements of the claims.

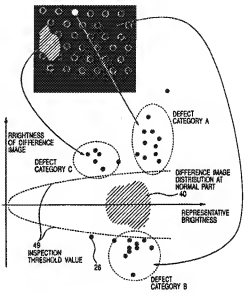
Applicant traverses on the grounds that Tanaka does not mark a target pixel as defective if the raw datum is within the threshold region. Instead, Tanaka marks the target pixel as defective if the raw datum is outside the threshold region. Tanaka's method is effectively identical to the conventional procedure whereby the object is marked as defective if the absolute value of the brightness difference is above a threshold.

The figures below illustrate the difference between the invention (LEFT) and Tanaka (RIGHT). In the invention, the threshold region is between two values; in Tanaka, the threshold region for defects is outside of two values plotted as a threshold curve mirrored about a zero value.

FIG. 20



Application, FIG. 9
Threshold region denotes range between two values



In Tanaka, the "region" would be the area defined within the threshold curve (49). The objects labeled within this region are the normal parts (40); the defects A, B, and C fall outside of this region. In this way, Tanaka actually teaches the opposite of the current invention.

The Example shown in FIG. 10 of the application (*see also*, specification, page 10, lines 18-34) illustrates why the teaching of Tanaka is not helpful to that of the current invention. In FIG. 10, two types of defects are illustrated: (1) a killer defect of the S-poly patterning process having a gray level difference of between about 20 and 60, and (2) a non-killer striation defect having a gray level difference range of between -20 and -60. As the absolute values of both (1) and (2) defects are the same, and as Tanaka's threshold curve (49) is symmetric about the X-axis, then both (1) and (2) are detected outside of the curve. Under the current invention, in contrast, only the killer defect would be detected.

Claims 3, 4, 11, 12, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara (U.S. Patent No. 6,980,686 B2) in view of Spaeth (U.S. Patent No. 2,349,012).

This rejection is improper on the grounds that not all elements of the claims are shown by the cited art. Claims 3, 4, 11, 12, 22 and 23 cite to either base claim 1 or 19 which call for use of a "threshold region." Neither Kuwabara nor Spaeth teach the use of a threshold region. Removal of the rejection is respectfully requested.

Claims 3, 4, 11, 12, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara (U.S. Patent No. 6,980,686 B2) in view of Tanaka et al. (U.S. Patent No. 7,116,816 B2) as applied to claim 1 above, further in view of Spaeth (U.S. Patent No. 2,349,012).

The newly cited Tanaka reference does not teach the concept of marking pixels as defective if "within" the region (claims 3, 4, 11 and 12) or where the threshold region does not include a zero value (claims 22 and 23). Removal of the rejection is respectfully requested.

For the foregoing reasons, reconsideration and allowance of claims 1-27 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

Alan T. McCollom
Reg. No. 28,881

MARGER JOHNSON & McCOLLOM, P.C.
210 SW Morrison Street, Suite 400
Portland, OR 97204
503-222-3613
Customer No. 20575